1856MNRAS..16..174W

Note on Variable Stars. By A. D. Wackerbarth, Esq.

" Suppose a nebula, such as that from which the earth, sun, and planets, are supposed to have arisen, existing in space. Such a nebula would probably be composed of elements more or less the same as those whereof our own planet is formed. Some, indeed, of the latter we might suppose wanting, and others present which we possess not here; but on the whole, let us suppose that the chief elements of the earth are found in our nebula, which would thus form an immense spheroïd of nebulous matter revolving round its own minor axis; or rather, if the matter were not quite homogeneously distributed, on an axis passing through its centre of gravity. We may suppose, or not, as we please, that this nebula has a nucleus, as many nebulæ appear to have, and many not to have, any such portion; but in the former case we must suppose some little difference in the constitution of the particles towards the centre or position of the said nucleus. Our nebula, thus composed, may wander a longer or shorter period in space peacefully; but now let us suppose a disturbance such as that which broke up the nebulosity of the mass which forms the planetary system, and condensed it into separate globes. Such disturbance might come from without or from within; there are forces in nature to account for either. We have supposed all or many of the elements present; but in a nebulous form they would be in a finely-divided state, and many of them, perhaps all the baser metals, have such affinity to oxygen, as when, in that state, to take fire on coming in contact therewith; so that any cause, which would bring them and the oxygen into contact, would cause fearful explosions, and set the whole nebula in ignition, condensing it into burning masses, each by the violent explosions casting out smaller fused and burning masses into space, to revolve as burning globes around itself or the centre of gravity of the whole. But what would be the condition of one of these fused and blazing masses? Hydrogen is present as well as oxygen; and ignition must therefore immediately cause the production of water. An ocean is then poured down on the incandescent globe, to be cast up again, as steam, into a damp atmosphere formed by the nitrogen and the watery vapour. Here it cools, and is again poured down in torrents on the glowing mass; and this process must continue until the globe has sufficiently cooled for the water to be able to rest upon its surface. Now I imagine that the appearance of a globe in such a state, viewed at a stellar distance, must be variable; that, when the water is, in the form of steam, driven up into the atmosphere, the burning mass must glow with greater brilliancy; but when, the steam condensing, a boiling ocean is poured upon it, the violence of the conflagration must for a time abate, and thus the object assume a less brilliant appearance until the fire has succeeded in reconverting the water into steam, and driving it up again into the atmosphere.

" Another circumstance may be mentioned as possible, namely,

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some bodies may be at present in some parts already to a considerable degree cooled; at least sufficiently to be, at those parts, extinct, while other parts of them are yet fused and burning. Would not the revolution of such a body present the phenomena of a variable star?

" *Uppsala*, 1856, *Apr.* 22."

Description of an Observatory erected at Upper Tulse Hill.

By William Huggins, Esq.

" A short account of an Observatory lately erected by myself at Upper Tulse Hill will not, I think, be considered altogether void of interest, as the building combines, in an unusual manner, the several important advantages of perfect convenience of access, uninterrupted view of the horizon, and freedom from tremor.

" The building, as will be seen by the model, is raised upon columns to a height of sixteen feet above the ground, and is connected by an enclosed passage with the upper story of the cottage.

" It becomes thus, for all purposes of convenience and access, a part of the house; while its elevated position prevents the view of the heavens from being obstructed, as would otherwise be the case, by the cottage and neighbouring trees.

" The stability of the instruments is provided for by two massive, pyramidical columns of brickwork built in cement, and resting upon deep and broad foundations of concrete. These columns pass up through the floor of the building, with which they are wholly unconnected, to a proper height for the reception of the instruments. The iron columns, upon which the building is supported, repose likewise upon solid concrete foundations.

" The building, which is 18 feet long by 12 feet wide, is formed of a strong framework of wood. This is covered externally with plates of corrugated iron. To the inside of the framework a double boarding, with felt placed between, is nailed, and the whole of the interior is hung with varnished oak paper. The dome, 12 feet in diameter, is hemispherical, and rotates easily on three iron balls, running in channels of iron plate. The shutter of the dome, 18 inches wide, extends through slightly more than a quadrant; it runs upon rollers, on parallel ridges, placed outside the dome. The ridges are continued over from horizon to horizon, and the shutter travels over and back again by means of two lines of wire-rope attached to the axle of a small windlass, fixed on the inner side of the curb of the dome. The dome itself consists of a circular wooden curb, bearing a light frame-work of iron, covered over with thin sheet-zinc. The dome is lined with felt and painted oil-cloth. The transit-shutters are arranged in the usual manner.

" The following instruments are at present in the Observatory.

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